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SOURCE Radio, No 6, 1949, pp 36-38,

50X1-HUM

AN ULTRASHORT-WAVE RECEIVER

O. Tutorskiy

The editors of Radio note that uhf receivers described in previous issues were designed only for the amateur band of 70-72 Mc and were not capable of receiving uhf broadcast stations, in particular, the sound channels of transmissions from the Moscow and Leningrad Television Centers. The uhf receiver described below is designed to cover these additional wave lengths, and, according to the editors, will encourage greater activity on the part of radio amateur experimenters in the field of ultrashort-wave propagation, especially in view of reports that such transmissions are sometimes heard at distances of 800-1000 km.⁷

A superregenerative circuit, which has a sensitivity comparable to that of most superhet circuits, was selected for this receiver in order to achieve maximum simplicity in assembly and adjustment, and to make possible the use of economical components readily available to most amateurs.

Operational Features

The tuning range for the receiver, when components are selected as shown on the appended schematic diagram, is 40-80 Mc. This range may be shifted somewhat by displacing the turns of tuning coil L₂. The set will operate on any type of antenna, including an indoor antenna, but best results will be obtained by using an outdoor dipole (each arm 1-1.5 m in length). In some cases the coupling between L₁ and L₂ must be adjusted.

Thorough operational tests showed that the receiver has high sensitivity of the order of 2-3 μ v, and will receive all stations audible on the finest superhets. With an outdoor dipole antenna, loudspeaker reception was possible from amateur radio stations UA3TSF and UA3DI. With an indoor antenna, it was possible to tune in the Moscow FM Station (46 Mc) and the sound channel of Moscow Television Center (57 Mc). In receiving the FM signals, the receiver must be detuned slightly from the center frequency, which effectively subdues the high distortion. The ability of the set to receive the television sound channels provides a basis for recommending that it be installed in television receivers.

- 1 -

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Circuit Design

The receiver unit is assembled separately from its power supply, which can be provided from any suitable rectifier (200-300 v dc at 20-40 ma, and 6.3 v ac for the filaments). Satisfactory rectifiers can be built by using the transformers from the 6N-1, Salyut, and other receivers.

The set uses three identical tubes (Type 6J5 or 6C5). The first tube functions as an ordinary superregenerative detector. The coupling to the first audio tube is somewhat unusual in that transformer coupling, which is a source of parasitic oscillations difficult to eliminate, has been replaced by an inductance and a plate load resistance (R_2). The remaining circuit design features require no further explanation.

The 6J5 or 6C5 tube is capable of driving the loudspeaker of a Rodina receiver. However, if greater output is desired, it is suggested that a Type 6F6 or 6V6 tube be used in the output stage, with corresponding changes in other circuit components as required.

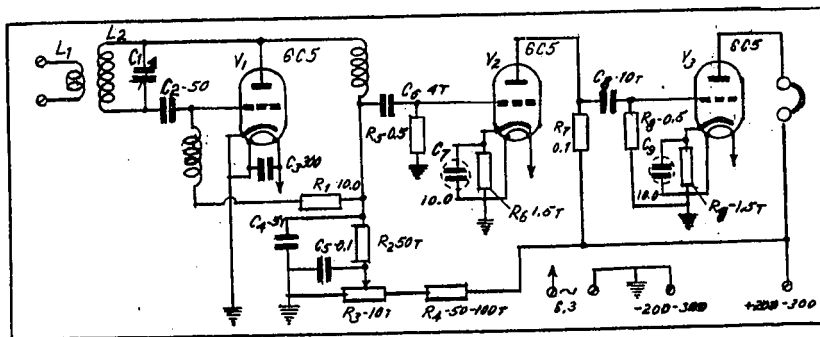
C_1 is a ceramic semivariable tuning capacitor (3-30 mmfd) and was selected on the basis of availability and low cost. However, a small air capacitor may be used if desired.

The antenna coupling coil L_1 has one turn of bare copper wire 2 mm in diameter (outside diameter of coil, 20 mm). The tuning coil L_2 has five turns of bare copper wire 20 mm in diameter (outside diameter, 20 mm; distance between centers of turns, 3 mm).

The chassis is U-shaped and can be made of aluminum, sheet iron, or plywood.

50X1-HUM

[Diagram follows]



Schematic Diagram for the UHF Receiver

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- 2 -

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